

NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

November 30, 2010

Precipitation and Snowpack

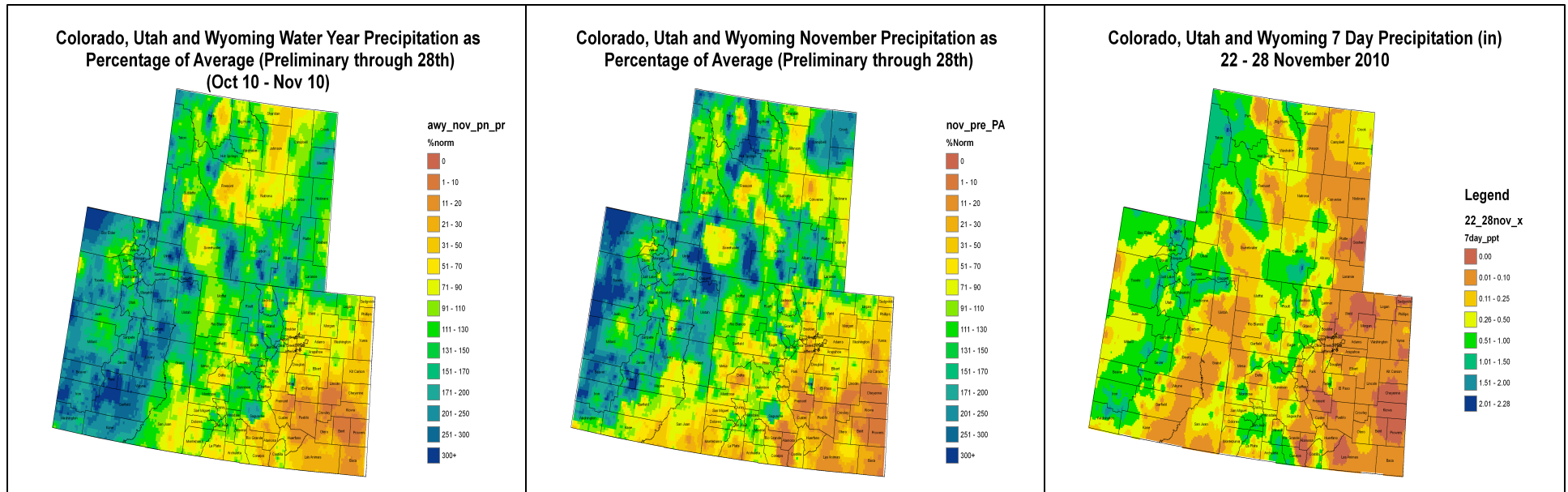


Fig. 1: WYTD precip as percent of ave. Fig. 2: November month-to-date precip as percent of ave. Fig. 3: November 22 – 28 precip in inches.

For the current water year (October 2010 – present), the western portion of the Upper Colorado River Basin has received plenty of moisture with several counties in Utah seeing over 200% of average (Fig. 1). For the water year, and also for the month of November, the eastern plains of Colorado, the Rio Grande basin, and the four-corners region have been abnormally dry (Fig. 2). Sweetwater County, WY has also been fairly dry for the month of November.

Over the last week, areas of heavier precipitation have been spotty (Fig. 3). Parts of the northern mountains of Colorado and in the Lower Green River basin received anywhere from half an inch to over an inch of precipitation. The eastern plains received very little relief, with several counties seeing no precipitation at all for the week. The western part of the Rio Grande basin received some moisture, though the eastern part remained very dry.

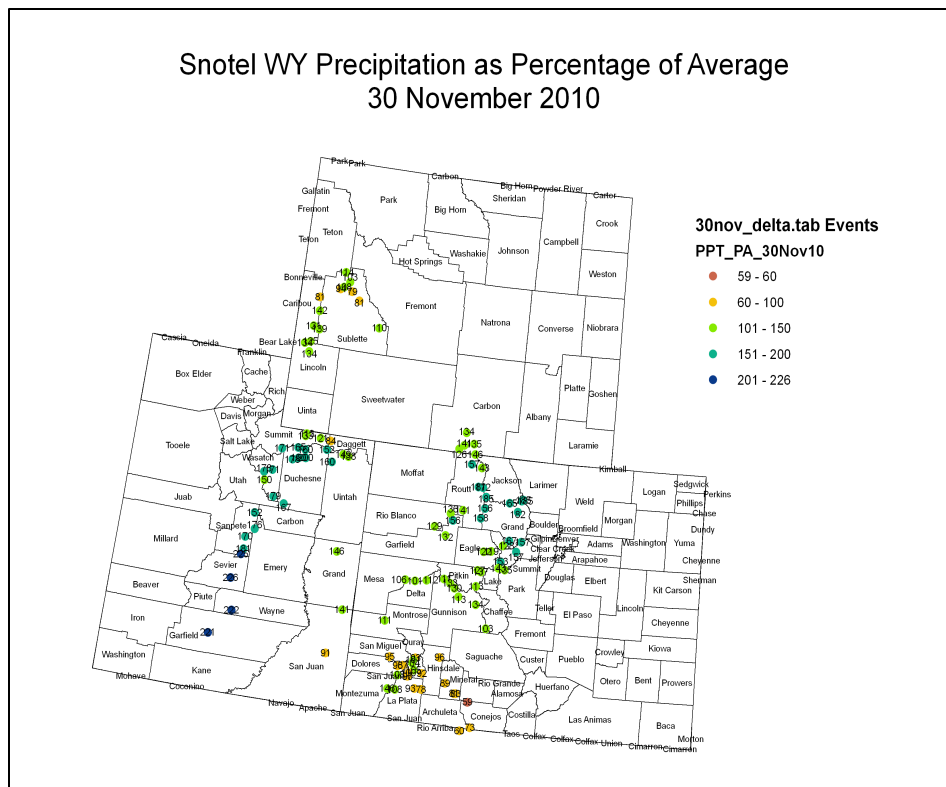


Fig. 4: SNOTEL WYTD precipitation percent of average.

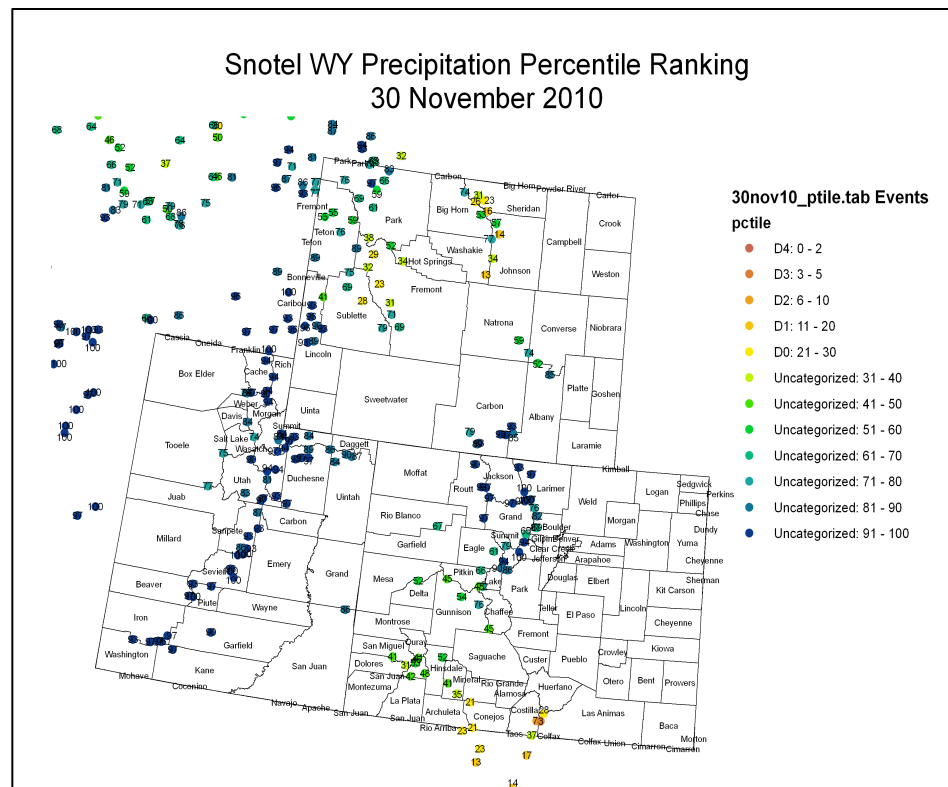


Fig. 5: SNOTEL WYTD precipitation percentiles (50% is median, 21-30% is Drought Monitor's D0 category).

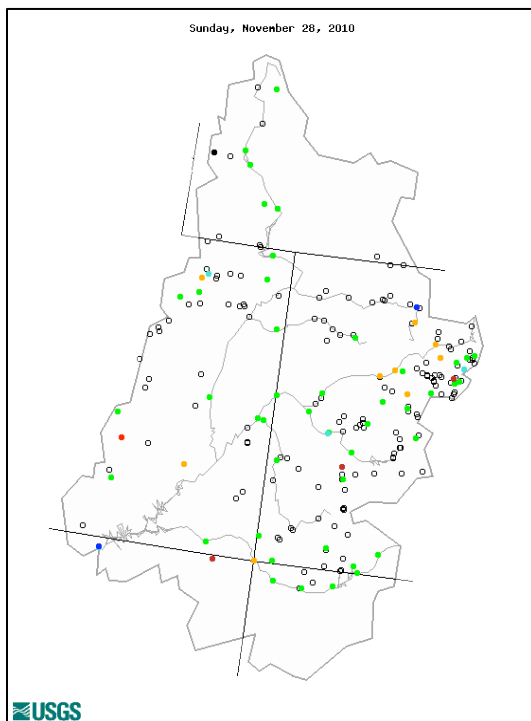
For most of the UCRB, SNOTEL water-year-to-date (WYTD) precipitation has been near or above average (Fig. 4). Though most of the UCRB received below average precipitation for the week, the Colorado headwaters region still shows WYTD percents of average over 100; much of the western part of the UCRB in Utah is still over 150% of average for the water year. SNOTEL sites in the San Juan basin and in the northern portion of the Upper Green River basin have received less than 100% of average precipitation for the water year.

Percentile rankings for the SNOTEL stations around the UCRB show most stations ranked fairly high (Fig. 5). Aside from a few stations in the Rio Grande basin and along the eastern border of the Upper Green River basin, most stations are showing percentiles in the 70s to 90s—meaning less than thirty percent of the water years on record have been wetter by this time. The lowest percentiles match up with the areas of lowest percents of average, meaning that it is rare for these areas to have such dry beginnings to the water year.

Streamflow

As of November 28th, around 80% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 6). Though an increasing number of streams have frozen over, the majority of gages still recording show decent 7-day average flows for this time of year. The Colorado headwaters region currently has the highest density of gages reporting below normal flows.

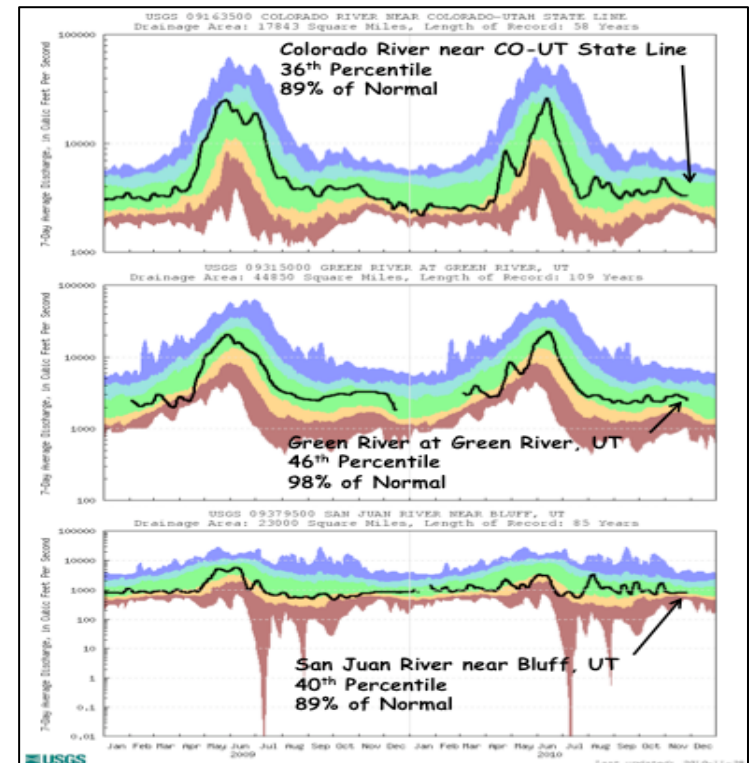
Looking at hydrographs from several sites around the UCRB, slight improvement can be seen along the Colorado and San Juan Rivers, while discharge decreased on the Green River (Fig. 7). Discharges at the Colorado River at the CO-UT state line and the San Juan River near Bluff, UT are both 89% of normal. The Green River at Green River, UT is at 98% of normal (a 22% drop from last week). All three gages show 7-day average discharge within the normal percentile range, though all show below normal cumulative runoff for the calendar year.



Explanation - Percentile classes							
●	●	●	●	●	●	●	○
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Fig. 6: USGS 7-day average streamflow compared to historical streamflow for November 28th in the UCRB.

Fig. 7: USGS 7-day average discharge over time at the CO-UT state line (top), Green River, UT (middle) and Bluff, UT (bottom).



Water Supply and Demand

Last week, temperatures in the UCRB were much cooler than average, with some regions seeing cool anomalies of more than 10° F. Soil conditions have continued to deteriorate just east of the UCRB, in the plains of Colorado (Fig. 8). Over the past week, a drying trend in the soils is also showing up in southern Wyoming, and the four corners region continues to show poor soil conditions.

Flaming Gorge, McPhee, Navajo, and Lake Granby reservoirs are all above average levels for this time of year. Blue Mesa Reservoir still shows below average levels, though its total volume increased by 3,600 acre feet since the beginning of the month (when volume is normally decreasing). Green Mountain Reservoir stayed fairly steady for the month. As of the 29th, releases out of Lake Powell were just over 395,000 acre feet, which was slightly above projected. However, total inflow volume into Lake Powell was also over what was forecast. Lake Powell is currently 77% of its November average and 61% of capacity.

Precipitation Forecast

A fairly dry week is in store for most of the UCRB, with no major systems forecast for the area through Friday. The exception to this will be in the northern ranges of Colorado and along the Continental Divide, where lingering moisture will combine with weak disturbances to produce light snow showers. This activity should be confined to high terrain in northwest Colorado and along the Continental Divide, with Quantitative Precipitation fields showing less than 0.1 inches over Jackson, Grand and Routt counties. Moving into the weekend another weak piece of energy will move across northern Colorado and boost chances for snow showers in northern Colorado and Utah. Beyond this weekend forecast confidence quickly decreases as models have trouble dealing with the evolution of the next trough.

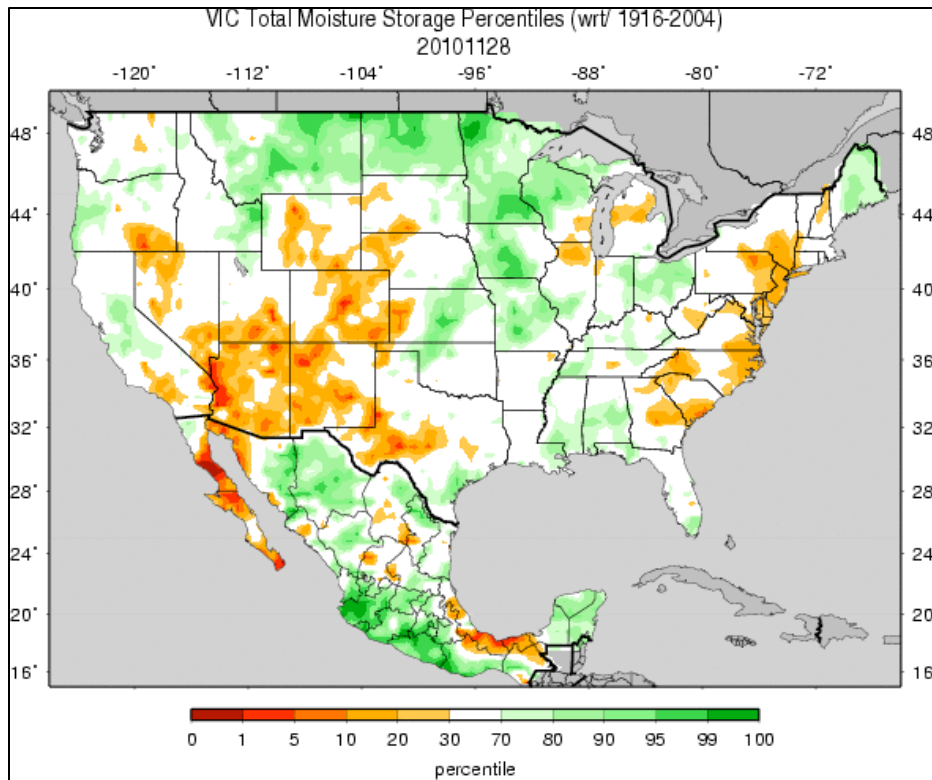


Fig. 8: VIC soil moisture percentiles as of November 28th.

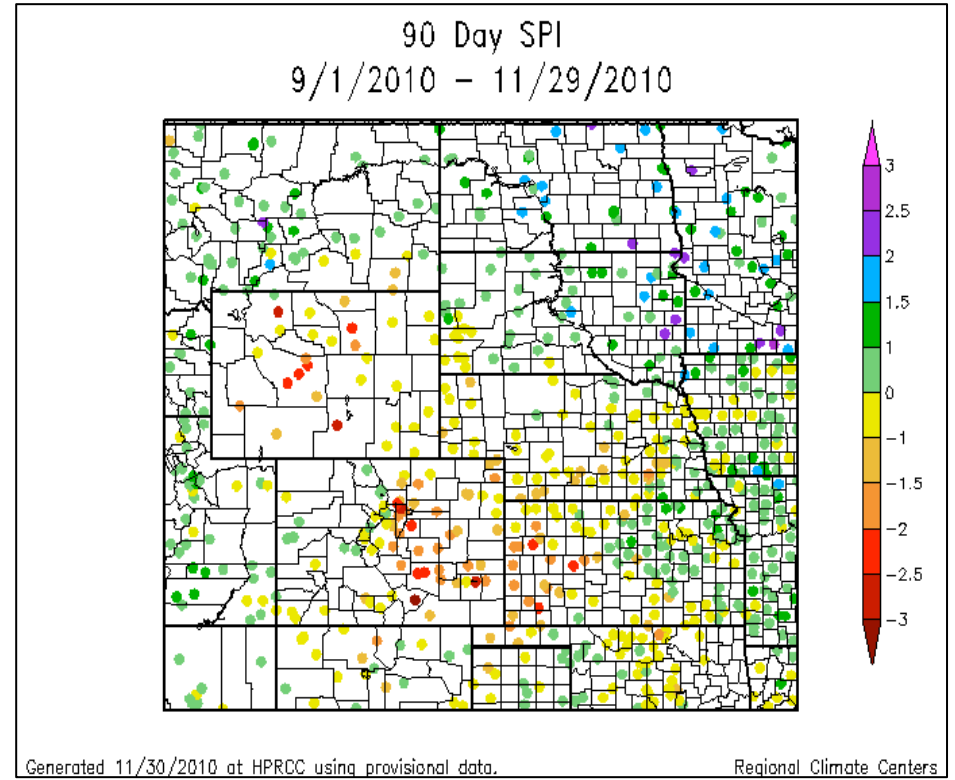


Fig. 9: 90 day standardized precipitation index.

Drought and Water Discussion

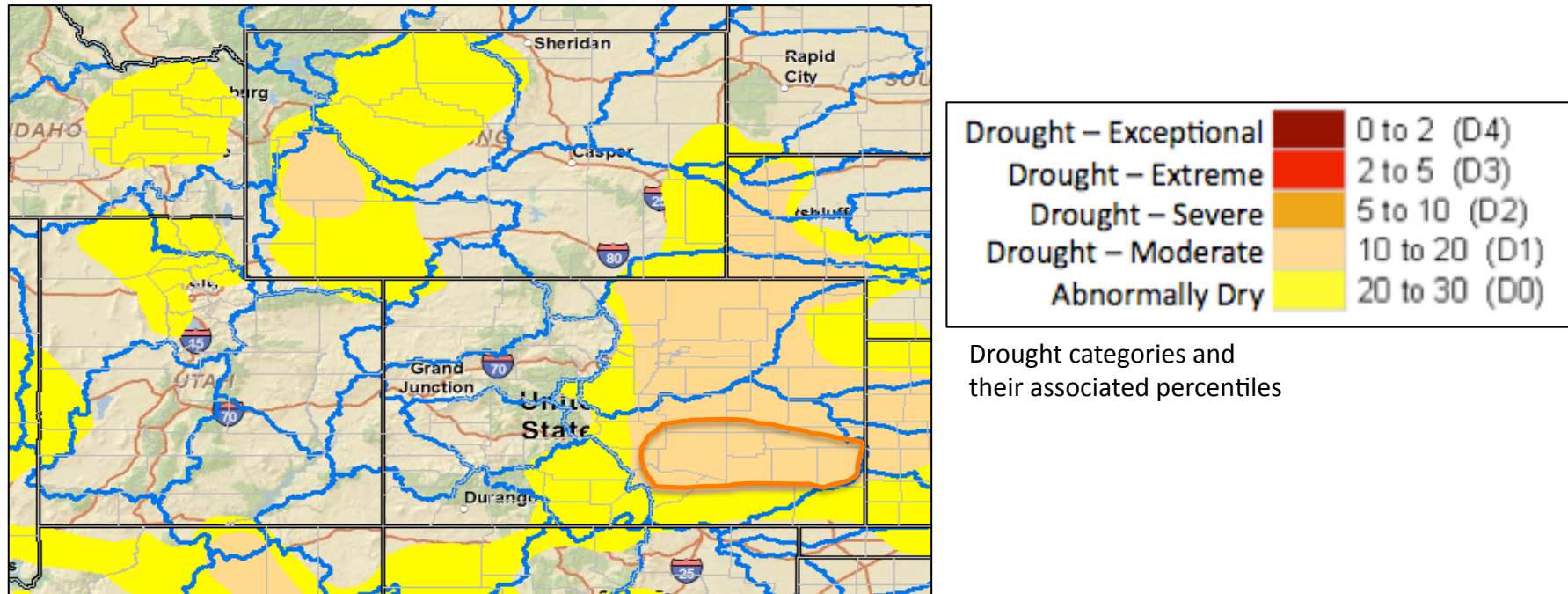


Fig. 10: November 23rd release of U.S. Drought Monitor for the UCRB

The current 90-day Standardized Precipitation Index (SPI) map shows values of -2 to -3 in Bent, Huerfano, and Pueblo counties in Colorado, east of the UCRB (Fig. 9). Longer term and shorter term SPI values are also very poor for these regions in the Arkansas River valley. Therefore, it has been suggested to introduce D2 to the current U.S. Drought Monitor map (Fig. 10). The orange line denotes the ideal placement of the D2.

No other suggestions have been made, therefore status quo is recommended for the rest of the region.